

WHAT IS CLAIMED IS:

1. A three-dimensional image optical system comprising an elementary image optical subsystem that includes
5 plural afocal optical elements placed in a planar array to form an elementary image optical subsystem, wherein

each of said afocal optical element has a first optical component and a second optical component both aligned in such a distance that an optical convergence area of said first
10 optical component and optical convergence area of said second optical component spatially coincide.

2. A three-dimensional image optical system according to Claim 1, wherein

15 said first optical component and said second optical component both aligned in such a distance that said first optical component and said second optical component are aligned in a common optical axis in which optical focal points of said first optical component and said second optical
20 component coincide.

3. A three-dimensional image optical system according to Claim 2, wherein

a focal length of said first optical component and a focal
25 length of said second optical component are different.

4. A three-dimensional image optical system according to Claim 2, wherein

said first optical component has a convergent focal
30 length and said second optical component has a virtual focal length.

5. A three-dimensional image optical system

according to Claim 1, wherein

at least one of said first optical component and said second optical component is a radial graded refractive index rod lens.

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6. A three-dimensional image optical system according to Claim 5, wherein

optical length Z_u of said first optical component is in a range of $0 < Z_u < P/2$ and different from optical length Z_u of said
10 second optical component which is in a range of $0 < Z_u < P/2$ where a normalized meridional serpentine period $P = 2\pi/A^{1/2}$ is defined by optical property parameter A of said first and second optical components.

15 7. A three-dimensional image optical system according to Claim 5, wherein

optical length Z_u of said first optical component is in a range of $0 < Z_u < P/2$ and optical length Z_u of said second optical component is in a range of $P/2 < Z_u < P$ where a normalized
20 meridional serpentine period $P = 2\pi/A^{1/2}$ is defined by optical property parameter A of said first and second optical components.

25 8. A three-dimensional image optical system according to Claim 1, wherein

said first optical component and said second optical component are both held with an optical gobo element.

30 9. A three-dimensional image optical system according to Claim 2, wherein

said first optical component and said second optical component are both held with an optical gobo element.

10. A three-dimensional image optical system according to Claim 5, wherein

said first optical component and said second optical component are both held with an optical gobo element.

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11. A three-dimensional image optical system according to Claim 1, wherein

even quantity of said elementary image optical subsystems, which are placed in a series with distances so that
10 an image reproduced by a foreside elementary image optical subsystem locates before a subsequent elementary image optical subsystem, are employed.

12. A three-dimensional image optical system
15 according to Claim 2, wherein

even quantity of said elementary image optical subsystems, which are placed in a series with distances so that
an image reproduced by a foreside elementary image optical subsystem locates before a subsequent elementary image optical
20 subsystem, are employed.

13. A three-dimensional image optical system according to Claim 5, wherein

even quantity of said elementary image optical
25 subsystems, which are placed in a series with distances so that
an image reproduced by a foreside elementary image optical subsystem locates before a subsequent elementary image optical subsystem, are employed.